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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: James E. Wright

Serial No.:   09/757,849

Filing Date: January 9, 2001

Title: SYSTEM FOR SEARCHING COLLECTIONS OF LINKED OBJECTS

Examiner: Shahid Al Alam

Art Unit: 2172

Commissioner for Patents
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CERTIFICATE OF MAILING

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Susan M. Dinsmore

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Sir:

APPELLANT'S BRIEF UNDER 37 CFR § 1.192

Real Party in Interest

The real party in interest in the present application is CommSoft Corporation, by virtue of an assignment by the inventor, James Wright, recorded at Reel 011850, Frame 0153.

Related Appeals and Interferences

There are no related appeals or interferences.

Status of Claims

Claims 1-17, 19, and 20 are pending in the application. Claim 18 was cancelled by the Office Action Response filed February 26, 2003.

Status of Amendments

There are no unentered amendments.

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Summary of Invention

The present invention includes methods of searching collections of linked objects and displaying the results. The invention is of particular utility when the links between objects (*e.g.*, legal citations or bibliographic references) themselves tend to convey useful information about the objects. According to the inventive methods, once a search group is acquired, the links from the target objects are used to determine at least one display attribute of the search set when it is displayed to the user. For example, links may be displayed as arrows or other connectors, or color, shape, size, position, highlighting, graphical flags, and/or labeling text may be used to convey information about the links.

Issues

There are two issues presented:

1. Whether claims 1, 16, 17, 19, and 20 are anticipated by Shah, *et al.*, "Infoharness: Managing Distributed, Heterogeneous Information" *IEEE Internet Computing*, Nov/Dec 1999 (hereinafter, "Shah").

2. Whether claims 2-15 are obvious over Shah in view of U.S. Patent No. 5,983,267 to Shklar, *et al.* (hereinafter, "Shklar").

Grouping of Claims

The claims do not stand or fall together, for the reasons set forth in the following section.

Argument

The Prior Art

Shah describes a metadatabase system for indexing heterogeneous groups of documents and images. The system allows searching of metadata to locate documents, and allows a user to create associations between objects. For example, a user may define a group of documents that all relate to the same subject. Shah calls the creation of such associations is called "annotation."

Shklar describes another system for representing data of heterogeneous types. The system tries to provide a uniform presentation format for the heterogeneous data by analyzing its internal organization (*e.g.*, into paragraphs, sections, articles, chapters, or frames), and displaying selected portions of the data.

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Claims 1 and 2

Independent claim 1 recites a method of searching a collection of linked objects and displaying the results. According to the method, a search group of heterogeneously typed objects is acquired (for example, by keyword searching or other known techniques). The objects are characterized in that at least one of the searched objects comprises a link to another object (for example, a bibliographic citation from one paper to another). For at least a portion of the objects in the acquired search group, the internal links are "followed" to determine their target objects. This determination includes determining whether the target objects are themselves inside or outside of the search group. Finally, at least one member of the acquired search group is displayed, where some aspect of the display (a "display attribute") is determined by the set of target objects. (For example, an object may be color-coded to indicate that it contains links to other objects within the search group).

Claim 1 currently stands rejected as anticipated by Shah. However, it contains two features not found in or suggested by Shah: *determination of link targets* and *using the set of linked targets to determine a display attribute.* While Shah allows a user to view a document retrieved from a search, neither user nor search engine necessarily follows any embedded links in that document to determine their targets. The mere loading of an object containing a link as suggested by Shah clearly does not determine the identity of the *link target* as required by the claim. A single target may have multiple incoming links, for example through different domains by reference to the examiner's HTML reference, and likewise, links may be either relative or absolute, or dynamic, such that the same apparent link "address" from two different objects or even from the same object at different times might yield two different link targets.

Further, and critically, there is absolutely no suggestion that either search engine or user should determine whether link targets are inside or outside of the originally acquired search group, as recited by claim 1. In fact, failing to probe the target objects during the search to determine their identities, there is no way to even determine whether a link target would be inside the original search result group, since the link address from one object (e.g., an HTML page) to another might not be the same "address" followed to reach the second object as it was located in the original search.

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In addition, there is no disclosure in Shah of using the set of targets linked to by objects in a search group to determine display attributes of the group. The Examiner has suggested that this feature is satisfied simply by displaying an HTML document with underlined links. However, again, in this case, the display attribute (underlining) is not determined by the *targets* of the links, which are not loaded or searched by the browser, and in fact may not even exist (*e.g.*, dead or broken links), but solely by the original HTML page and the browser settings. The undetermined *link targets* therefore cannot possibly be the basis for changing the display attributes of the group or in this example the originally displayed object (the HTML page).

Since claim 1 contains two features not found in Shah, it cannot be anticipated under 35 U.S.C. § 102 by that reference. In addition, it is not obvious over Shah, because these two features are not suggested or in any way obvious modifications of that reference.

Independent claim 2 includes all of the features of claim 1, and also recites that displayed representation of search objects are arranged in layers, which may be independently hidden or shown by a user. This claim currently stands rejected as obvious over Shah in view of Shklar. The arguments set forth above in connection with claim 1 and Shah apply equally to claim 2. Nothing in Shah renders the features of *determination of link targets* and *using the set of linked targets to determine a display attribute* as obvious. These deficiencies are not remedied by Shklar, which is relied upon primarily to teach the use of layers.

To the extent that Shklar discusses links at all, it describes internal links within a single document, linking one section of the document to another. In contrast, claim 2, like claim 1, recites that an object comprises a link to *another* object – an "external" link. Thus, the links in Shklar are not even the same type as those recited in claim 2. Further, nothing in Shklar suggests determining link targets as recited in claim 2. Not only is there no disclosure of determining whether link targets are inside or outside of the originally acquired search group, such a determination would not even make sense in the context of internal links (since by definition, they point to an object in the search group – the same object from which they originate). Similarly, the set of target objects is not used to determine a display attribute, because the set of target objects is always the same for a document with only internal links – it consists solely of the originating object.

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Since neither Shah nor Shklar suggests determining whether linked objects are inside or outside the search group, or using the set of linked objects to determine a display attribute, they cannot render claim 1 or claim 2 obvious under 35 U.S.C. § 103.

Claims 3-15

Claims 3-15 depend (directly or indirectly) in the alternative from either claim 1 or claim 2, and thus cannot be considered obvious over the combination of Shah and Shklar for the reasons set forth above. However, certain of these claims also recite additional features not found in either reference, and thus must independently be considered nonobvious.

Claim 4 recites that representations of a plurality of objects from a search set are displayed on a graph. The specification defines a graph at page 4, lines 11-13, as "a two-dimensional or three-dimensional visual representation of linked objects, where a link is displayed as a connector." An example of representations of objects displayed on a graph may be found in Figure 2 of the present application. Nothing in either Shah or Shklar suggests showing representations of linked objects on a graph. The Examiner has cited page 22, right column, lines 3-23 of Shah for this proposition, but that reference teaches only display of a single object itself, rather than a display of representations of multiple related objects on a graph. No connectors are shown or described, and only the single object is shown.

Claim 5 recites that representations of a plurality of objects are displayed, and that at least one link between objects is depicted by a connector between these representations. As discussed above, neither Shah nor Shklar teaches or suggests displaying a plurality of object representations and a connector between representations.

Claim 6 depends from claim 5, and further adds that the connector has a display attribute determined by (i) the source object type, (ii) the target object type, or (iii) the link type. Shah and Shklar do not even show connectors, and certainly do not display those connectors differently depending on type. Further, neither reference makes any suggestion that links may have different types.

Claim 8 recites that determining link targets includes not only determining the set of all objects linked to by the original search group, it further includes recursively determining the set of all objects linked to by the expanded set of objects consisting of the union of the search group

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and the set of objects linked to by the search group. Shah and Shklar do not determine the set of objects linked to by a search group, and certainly do not determine "second-order" links by following a chain of outward links.

Claims 16, 17, 19, and 20

Independent claim 16 recites a search method that includes annotating the results of a search. That is, a user may attach notes to individual objects returned by the search, and these notes may be selectively displayed when viewing the search results. The search results are displayed on a graph. This claim (and its dependent claims 17, 19, and 20) currently stands rejected as anticipated by Shah.

As discussed above, Shah does not teach or suggest the display of representations of search objects on a graph, and for that reason alone, cannot anticipate claims 16, 17, 19, and 20. In addition, while Shah does use the term "annotate," it does not do so in the same sense as the present application, and cannot be considered to describe this feature of claim 16. In Shah, "annotation" is not the attaching of a note to a specific object, but is the classification of an object into a group by establishing an "annotation relationship" between objects. Such a relationship cannot anticipate the attachment of a note to a single object. Further, Shah does not describe the selective display of annotations, as also recited by claim 16.

In addition, dependent claim 20 adds that representations of objects are displayed with connectors representing links between the objects, and that these links may be annotated. As discussed above, Shah does not teach the display of connectors to represent links between objects, and certainly does not teach the annotation of such links. Thus, claim 20 is also not anticipated for this independent reason.

Conclusion

For the reasons set forth above, claims 1, 16, 17, 19, and 20 are not anticipated by Shah, and claims 2-15 are not obvious over Shah in view of Shklar. Applicant therefore respecfully requests that the Board remove all rejections and allow the present claims to pass to issuance.

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Respectfully submitted,

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APPENDIX

1. (Original) A method of searching a collection of linked objects and displaying the results, comprising:

    acquiring a search group of heterogeneously typed objects, wherein at least one of the objects comprises a link to another object;

    determining for at least a portion of the objects in the search group a set of targets of links from the objects, including determining whether the link targets are inside the search group; and

    displaying a representation of at least one searched object, the representation having at least one display attribute determined by the set of link targets.

2. (Original) A method of searching a collection of linked objects and displaying the results, comprising:

    acquiring a search group of objects, wherein at least one of the objects comprises a link to another object;

    determining for at least a portion of the objects in the search group a set of targets of links from the objects, including determining whether the link targets are inside the search group; and

    displaying a representation of at least one searched object, the representation having at least one display attribute determined by the set of link targets,

    wherein displayed representations are arranged into a plurality of display layers, and wherein the display layers can be independently hidden or displayed.

3. (Original) The method of claim 1 or 2, wherein the display attribute is selected from the group consisting of color, shape, size, position, highlighting, graphical flags, and labeling text.

4. (Original) The method of claim 1 or 2, wherein representations of a plurality of objects are displayed on a graph.

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5. (Original) The method of claim 1 or 2, wherein representations of a plurality of objects are displayed, and wherein at least one link between objects is depicted by a connector between the representations.

6. (Original) The method of claim 5, wherein a display attribute of the connector is determined by a property selected from the group consisting of the type of the linking object, the type of the link target, and the type of the link.

7. (Original) The method of claim 1 or 2, wherein a display attribute of the representation is determined by object metadata.

8. (Original) The method of claim 1 or 2, wherein determining link targets includes recursively determining targets of links of an expanded set of objects comprising the original search group and the objects linked to by the search group.

9. (Original) The method of claim 8, wherein the recursion level is in the range of 1-10.

10. (Original) The method of claim 1 or 2, wherein the search objects comprise documents selected from the group consisting of legal opinions, legal treatises, statutes, briefs, and law review articles.

11. (Original) The method of claim 1 or 2, wherein the search objects comprise scientific or medical writings, and wherein the links comprise citations to other scientific or medical writings.

12. (Original) The method of claim 1 or 2, wherein the search objects comprise patents and patent applications and the links comprise references to related patents and patent applications.

13. (Original) The method of claim 1 or 2, further comprising annotating at least one of the search objects.

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14. (Original) The method of claim 1 or 2, wherein at least a portion of the searched objects and link targets are classified into a plurality of groups, further comprising setting a display attribute for all members of a group.

15. (Original) The method of claim 1 or 2, wherein displayed representations are sorted on at least one axis according to a property of the objects represented.

16. (Previously presented) A method of searching a collection of objects and displaying the results, comprising:

acquiring a first search group of objects;

displaying a representation of at least a portion of the first search group of objects on a graph; and

annotating one or more members of the first search group of objects, wherein annotations may be selectively displayed with the representation of the annotated objects.

17. (Original) The method of claim 16, further comprising:

acquiring a second search group of objects; and

displaying a representation of at least a portion of the second search group of objects, wherein displaying the representation of annotated objects that are members of both the first search group and the second search group includes selectively displaying annotations of the objects.

18. (Cancelled)

19. (Original) The method of claim 16, wherein the objects include links to other objects, and wherein at least a portion of the links are displayed as connectors between representations of the objects.

20. (Original) The method of claim 19, further comprising annotating one or more links.

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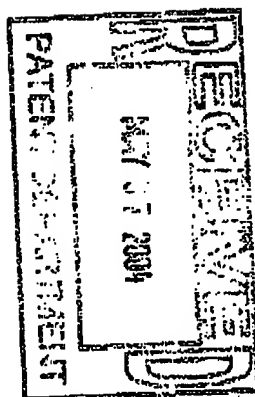
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